Genomic DNA from forensic samples

User manual

NucleoSpin® DNA Trace

March 2012 / Rev. 05

MACHEREY-NAGEL

Genomic DNA from forensic samples

Protocol-at-a-glance (Rev. 05)

		Funnel	NucleoSpin® DNA Trace
1	**Lyse sample**		4–8 mL FLB 50 µL Proteinase K 56 °C, 1 h
2	**Clarify sample**		≥ 5,000 x *g*, 10 min
3	**Adjust DNA binding conditions**		3.5 mL ethanol Vortex
4	**Bind DNA**	 	Load sample 3,000 x *g*, 3 min
5	**Wash silica membrane**	 	1st wash 2.5 mL BW 2st wash 5 mL B5 3rd wash 5 mL B5 1st, 2nd, 3rd 3,000 x *g*, 3 min
6	**Dry silica membrane**		3,000 x *g*, 10 min
7	**Elute DNA**	 	100 µL BE (70 °C) RT, 2 min 3,000 x *g*, 3 min

MACHEREY-NAGEL GmbH & Co. KG · Neumann-Neander-Str. 6–8 · 52355 Düren · Germany
Tel.: +49 24 21 969-270 · Fax: +49 24 21 969-199 · tech-bio@mn-net.com · ***www.mn-net.com***

Table of contents

1 Components 4

1.1 Kit contents 4

1.2 Reagents, consumables, and equipment to be supplied by user 5

1.3 About this user manual 5

2 Product description 6

2.1 The basic principle 6

2.2 Kit specifications 6

3 Storage conditions and preparation of working solutions 8

4 Safety instructions 9

4.1 Risk and safety phrases 9

4.2 GHS classification 10

5 Protocols 12

5.1 Isolation of genomic DNA from solid samples, for example small amounts of cells or tissue (forensic samples) 12

5.2 Isolation of genomic DNA from human bones 14

6 Appendix 16

6.1 Troubleshooting 16

6.2 Ordering information 17

6.3 Product use restriction/warranty 17

1 Components

1.1 Kit contents

	NucleoSpin® DNA Trace	
	4 preps	**25 preps**
REF	**740942.4**	**740942.25**
Lysis Buffer FLB	50 mL	250 mL
Wash Buffer BW	15 mL	75 mL
Wash Buffer B5 (Concentrate)*	20 mL	80 mL
Elution Buffer BE**	5 mL	15 mL
NucleoSpin® DNA Trace F Columns (plus Collection Tubes)	4	25
Proteinase K (lyophilized)*	6 mg	30 mg
Proteinase Buffer PB	0.8 mL	1.8 mL
Collection Tubes (50 mL)	4	25
Elution Tubes (0.5 mL)	4	25
User manual	1	1

* For preparation of working solutions and storage conditions see section 3.

** Composition of Elution Buffer BE: 5 mM Tris/HCl, pH 8.5

1.2 Reagents, consumables, and equipment to be supplied by user

Reagents

- Ethanol (96–100 %) to prepare Buffer B5 and to adjust DNA binding conditions)

Consumables

- Disposable pipette tips
- 15 mL and 50 mL centrifugation tubes

Equipment

- Manual pipettors
- Centrifuge with swing-out rotor, suitable for 15 mL amd 50 mL tubes
- Suitable homogenization device (e.g., mortar and pestle, rotor-stator)
- Personal protection equipment (e.g., lab coat, gloves, goggles)

1.3 About this user manual

It is strongly recommended that first-time users of the **NucleoSpin® DNA Trace** kit read the detailed protocol sections of this user manual. Experienced users, however, may refer to the Protocol-at-a-glance instead. The Protocol-at-a-glance is designed to be used only as a supplemental tool for quick referencing while performing the purification procedure.

All technical literature is available on the internet at ***www.mn-net.com***.

Please contact Technical Service regarding information about changes of the current user manual compared to previous revisions.

2 Product description

2.1 The basic principle

NucleoSpin® DNA Trace allows DNA isolation from cells, tissue, and many other sources. Lysis is achieved by incubation of homogenized samples in a solution containing chaotropic ions and Proteinase K. Appropriate conditions for binding of DNA to the silica membrane in the **NucleoSpin® DNA Trace F Columns** are created by chaotropic salt and ethanol. The binding process is reversible and specific to nucleic acids. Contaminations are removed by repeated washing with 2 different ethanolic buffers. Pure genomic DNA is finally eluted under low ionic strength conditions in a slightly alkaline elution buffer.

2.2 Kit specifications

- **NucleoSpin® DNA Trace** kit is designed for the preparation of highly pure genomic DNA from small amounts of any tissue, cells and, forensic samples, for example dried blood spots. The **NucleoSpin® DNA Trace F Columns** included in the kit are ideally suited for collecting small amounts of nucleic acids from large volumes because these columns are shaped like a funnel combining a large volume capacity with a small diameter of the binding membrane (F means funnel). The DNA isolated by **NucleoSpin® DNA Trace F Columns** can be used directly for PCR or other enzymatic reactions.

- Age, storage conditions, quantity, and consistency of samples can affect DNA quality, and therefore the protocol may be adapted accordingly (e.g., increasing incubation time). For successful DNA preparation, it is essential that the sample is lysed well and separated afterwards – only clear lysates should be loaded onto **NucleoSpin® DNA Trace F Columns** in order to avoid clogging of the silica membrane.

- The **NucleoSpin® DNA Trace** kit allows purification of up to 20 µg of pure genomic DNA with an A_{260}/A_{280} ratio of between 1.70 and 1.90. Some samples (especially forensic samples) may contain only traces of DNA. However, the amount will be sufficient for amplification and detection reactions.

- Additional enzymes, which are not included in the kit, may be necessary for lysis of certain bacteria (e.g., lysozyme, lysostaphine).

- Support protocol for the isolation of genomic DNA from human bones. For this application additional Buffer T1, Buffer B3, and Proteinase K are necessary. Therefore MACHEREY-NAGEL offers the **NucleoSpin® DNA Trace Bone Buffer Set** (see ordering information). This buffer set is especially designed for completion of the **NucleoSpin® DNA Trace** kit. It is suited for 25 preparations of genomic DNA from human bones in conjunction with the **NucleoSpin® DNA Trace** kit (REF 740942.25).

Table 1: Kit specifications at a glance

Parameter	NucleoSpin® DNA Trace
Technology	Silica-membrane technology
Format	Funnel columns
Sample material	Forensic samples, buccal swabs, blood spots
Sample size	Forensic samples which can be extracted with up to 8 mL Lysis Buffer FLB (in general 10 mg tissue, < 10^5 cells)
Fragment size	200 bp–approx. 50 kbp
Typical recovery	> 70 % for amounts > 10 ng
A_{260}/A_{280}	1.7–1.9
Elution volume	100 µL
Preparation time	60 min/prep (without Proteinase K incubation time which needs > 1 h)
Binding capacity	20 µg

3 Storage conditions and preparation of working solutions

Attention: Buffers FLB and BW contain chaotropic salts! Wear gloves and goggles!

CAUTION: Buffers FLB and BW contain guanidine hydrochloride which can form highly reactive compounds when combined with bleach (sodium hypochlorite). DO NOT add bleach or acidic solutions directly to the sample-preparation waste.

- All kit components can be stored at room temperature (18–25 °C) and are stable for at least one year.
- Upon storage, especially at low temperatures, a white precipitate may form in Lysis Buffer FLB. Such precipitates have to be dissolved by incubating at 45–50 °C for 10 min before use.

Before starting any **NucleoSpin® DNA Trace** protocol, prepare the following:

- **Wash Buffer B5:** Add the indicated volume of ethanol (96–100 %) to **Buffer B5 Concentrate**. Mark the label of the bottle to indicate that ethanol was added. Store Wash Buffer B5 at room temperature (18–25 °C) for at least one year.
- Before first use of the kit, add the indicated volume (see table below or on the bottle) of Proteinase Buffer PB to dissolve lyophilized **Proteinase K**. Proteinase K solution is stable at - 20 C for at least 6 months.

	NucleoSpin® DNA Trace	
	4 preps	**25 preps**
REF	**740942.4**	**740942.25**
Wash Buffer B5 (Concentrate)	20 mL Add 80 mL ethanol	80 mL Add 320 mL ethanol
Proteinase K	6 mg Add 300 µL Proteinase Buffer	30 mg Add 1.5 mL Proteinase Buffer

4 Safety instructions

The following components of the **NucleoSpin® DNA Trace** kits contain hazardous contents.

Wear gloves and goggles and follow the safety instructions given in this section.

4.1 Risk and safety phrases

Component ***Inhalt***	**Hazard contents** ***Gefahrstoff***	**Hazard symbol** ***Gefahrstoff-symbol***	**Risk phrases** ***R-Sätze***	**Safety phrases** ***S-Sätze***
FLB	Guanidine hydrochloride 1–10 % *Guanidinhydrochlorid 1–10 %*	Substance does not have to be specially labeled as hazardous. *Die Substanz muss nicht als gefährlich gekennzeichnet werden.*		
BW	Guanidine hydrochloride 36–50 % + isopropanol 20–50 % *Guanidinhydrochlorid 36–50 % + Isopropanol 20–50 %*	✖ Xn*	R 10-22-36-67	S 16-26-39
Proteinase K	Proteinase K, lyophilized *Proteinase K, lyophilisiert*	✖ Xn	R 36/37/38-42	S 22-24-26-36/37

Risk phrases

R 10	Flammable. *Entzündlich.*
R 22	Harmful if swallowed. *Gesundheitsschädlich beim Verschlucken.*
R 36/37/38	Irritating to eyes, respiratory system, and skin. *Reizt die Augen, Atmungsorgane und die Haut.*
R 36	Irritating to eyes. *Reizt die Augen.*
R 42	May cause sensitization by inhalation *Sensibilisierung durch Einatmen möglich.*
R 67	Vapours may cause drowsiness and dizziness. *Dämpfe können Schläfrigkeit und Benommenheit verursachen.*

Safety phrases

S 16	Keep away from sources of ignition – No smoking. *Von Zündquellen fernhalten – Nicht rauchen.*
S 22	Do not breathe dust. *Staub nicht einatmen.*

* Hazard labeling not necessary if quantity per bottle below 125 g or mL (certificate of exemption according to 67/548/EEC Art. 25, 1999/45/EC Art. 12 and German GefStoffV § 20 (3) and TRGS 200 7.1). For further information see Material Safety Data Sheet.

Safety phrases

S 24	Avoid contact with the skin. *Berührung mit der Haut vermeiden.*
S 26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. *Bei Berührung mit den Augen gründlich mit Wasser abspülen und Arzt konsultieren.*
S 36/37	Wear suitable protective clothing and gloves. *Bei der Arbeit geeignete Schutzhandschuhe und Schutzkleidung tragen.*
S 39	Wear suitable eye / face protection. *Schutzbrille / Gesichtsschutz tragen.*

4.2 GHS classification

Only harmful features do not need to be labeled with H and P phrases until 125 mL or 125 g.

Mindergefährliche Eigenschaften müssen bis 125 mL oder 125 g nicht mit H- und P-Sätzen gekennzeichnet werden.

Component *Inhalt*	Hazard contents *Gefahrstoff*	GHS symbol *GHS Symbol*	Hazard phrases *H-Sätze*	Precaution phrases *P-Sätze*
FLB	Guanidine hydrochloride 1–10 % *Guanidinhydrochlorid 1–10 %*	Substance does not have to be specially labeled as hazardous *Die Substanz muss nicht als gefährlich gekennzeichnet werden.*		
BW	Guanidine hydrochloride 36–50 % + isopropanol 20–50 % *Guanidinhydrochlorid 36–50 % + Isopropanol 20–50 %*	Warning *Achtung*	226, 302, 319, 336	210, 233, 280, 301+312, 305+351+338, 330, 337+313, 403+235
Proteinase K	Proteinase K, lyophilized *Proteinase K, lyophilisiert*	Danger *Gefahr*	315, 319, 334, 335	261, 280, 302+352, 304+340, 305+351+338, 312, 332+313, 337+313, 342+311, 403+233

Hazard phrases

H 226	Flammable liquid and vapour. *Flüssigkeit und Dampf entzündbar.*
H 302	Harmful if swallowed. *Gesundheitsschädlich bei Verschlucken.*
H 315	Causes skin irritation. *Verursacht Hautreizungen.*
H 319	Causes serious eye irritation. *Verursacht schwere Augenreizung.*

Hazard phrases

H 334	May cause allergy or asthma symptoms or breathing difficulties if inhaled. *Kann bei Einatmen Allergie, asthmaartige Symptome oder Atembeschwerden verursachen.*
H 335	May cause respiratory irritation. *Kann die Atemwege reizen.*
H 336	May cause drowsiness or dizziness. *Kann Schläfrigkit und Benommenheit verursachen.*

Precaution phrases

P 210	Keep away from heat / sparks / open flames / hot surfaces – No smoking. *Von Hitze / Funken / offener Flamme / heißen Oberflächen fernhalten.*
P 233	Keep container tightly closed *Behälter dicht verschlossen halten.*
P 261	Avoid breathing dust. *Einatmen von Staub vermeiden.*
P 280	Wear protective gloves / eye protection. *Schutzhandschuhe / Augenschutz tragen.*
P 301+312	IF SWALLOWED: Call a POISON CENTER or doctor /physician if you feel unwell. *BEI VERSCHLUCKEN: Bei Unwohlsein GIFTINFORMATIONSZENTRUM oder Arzt anrufen.*
P 302+352	IF ON SKIN: Wash with plenty of soap and water. *BEI KONTAKT MIT DER HAUT: Mit viel Wasser und Seife waschen.*
P 304+340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. *BEI EINATMEN: An die frische Luft bringen und in einer Position ruhigstellen, die das Atmen erleichtert.*
P 305+351+338	IF IN EYES: Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing. *BEI KONTAKT MIT DEN AUGEN: Einige Minuten lang behutsam mit Wasser spülen. Vorhandene Kontaktlinsen nach Möglichkeit entfernen. Weiter spülen.*
P 312	Call a POISON CENTER or doctor / physician if you feel unwell. *Bei Unwohlsein GIFTINFORMATIONSZENTRUM oder Arzt anrufen.*
P 330	Rinse mouth. *Mund ausspülen.*
P 332+313	If skin irritation occurs: Get medical advice / attention. *Bei Hautreizung: Ärztlichen Rat einholen / ärztliche Hilfe hinzuziehen.*
P 337+313	Get medical advice / attention. *Bei anhaltender Hautreizung: Ärztlichen Rat einholen / ärztliche Hilfe hinzuziehen.*
P 342+311	If experiencing respiratory symptoms: Call a POISON CENTER or doctor / physician. *Bei Symptomen der Atemwege: GIFTINFORMATIONSZENTRUM oder Arzt anrufen.*
P 403+233	Store in a well ventilated place. Keep container tightly closed. *Behälter dicht verschlossen an einem gut belüfteten Ort augbewahren.*
P 403+235	Store in a well ventilated place. Keep cool. *Kühl an einem gut belüfteten Ort augbewahren.*

For further information please see Material Safety Data Sheets ***(www.mn-net.com).***
Weiterführende Informationen finden Sie in den Sicherheitsdatenblättern ***(www.mn-net.com)****.*

5 Protocols

5.1 Isolation of genomic DNA from solid samples, for example small amounts of cells or tissue (forensic samples)

Before starting the preparation:

- Check if Wash Buffer B5 was prepared according to section 3.
- Preheat Elution Buffer BE to 70 °C.

1 Lyse sample

Place the sample in a 15 mL centrifuge tube (not provided) and add **4–8 mL Buffer FLB**. The sample should be covered completely with Buffer FLB.

+ 4–8 mL FLB

Solid samples should be homogenized by commercial tools (pestle and mortar, rotor-stator homogeniser). In general, 10 mg tissue, < 10^5 cells or any DNA-containing solid sample can be used. Forensic samples (dried blood spots, chewing gum, swabs, etc.) should be covered completely with lysis buffer.

Add **50 µL Proteinase K** stock solution, mix by vortexing, and incubate at **56 °C** in a (shaking) water bath until complete lysis is obtained **(1–3 h or overnight)**.

+ 50 µL Proteinase K

56 °C, 1 h

Vortexing every 15 min (3–4 times) leads to shorter lysis times if no shaking water bath/incubator is available. Final incubation at 70–100 °C for 5 min may be recommended for optimal denaturation and lysis of difficult samples (e.g., dried, old or clotted blood samples).

2 Clarify sample

Afterwards, any insoluble particles remaining in the sample have to be removed by centrifugation for **10 min** at **≥ 5.000 x *g*** in order to avoid clogging of the NucleoSpin® DNA Trace membrane.

≥ 5,000 x *g*, 10 min

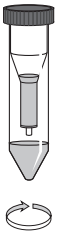
3 Adjust DNA binding conditions

Add **3.5 mL ethanol** (96–100 %) to **4 mL cleared FLB-lysate** and vortex the mixture. Use proportionally up scaled volumes of ethanol, if more FLB-lysate has been prepared in step 1.

+ 3.5 mL ethanol

Vortex

4 Bind DNA



Load sample

Pipette mixture onto the **NucleoSpin® DNA Trace F Column**.

3,000 x *g*, 3 min

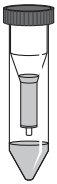
Centrifuge for **3 min** at **3,000 x *g***. Discard flow-through with Collection Tube. Put the NucleoSpin® DNA Trace F Column into a fresh Collection Tube (provided).

5 Wash silica membrane

+ 2.5 mL BW

1st wash

Add **2.5 mL Buffer BW** to the NucleoSpin® DNA Trace F Column. Centrifuge for **3 min** at **3,000 x *g***.



3,000 x *g*, 3 min

+ 5 mL B5

2nd wash

Add **5 mL Buffer B5** to the NucleoSpin® DNA Trace F Column. Centrifuge for **3 min** at **3,000 x *g***, discard flow-through and reuse Collection Tube.

3,000 x *g*, 3 min

+ 5 mL B5

3rd wash

Add **5 mL Buffer B5** to the NucleoSpin® DNA Trace F Column. Centrifuge for **3 min** at **3,000 x *g***, discard flow-through and reuse Collection Tube.

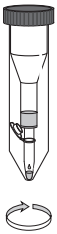
3,000 x *g*, 3 min

6 Dry silica membrane

3,000 x *g*, 10 min

Centrifuge additional **10 min** at **3,000 x *g*** in order to remove **Buffer B5** completely.

7 Elute DNA



+ 100 µL BE (70 °C)

RT, 2 min

Attach the supplied Elution Tube (0.5 mL) with adaptor to the NucleoSpin® DNA Trace F Column and insert assembly into a new 50 mL centrifufe tube (not provided). Pipette **100 µL Buffer BE** (preheated to 70 °C) onto the NucleoSpin® membrane and incubate for **2 min** at **room temperature**.

3,000 x *g*, 3 min

Centrifuge for **3 min** at **3,000 x *g*** to collect the nucleic acid-containing fraction.

Remove the elution tube containing the nucleic acids and keep it for further use.

5.2 Isolation of genomic DNA from human bones

Before starting with the preparation, please read remarks below.

- Before starting with the preparation, set incubators or water baths to 56 °C and 70 °C, respectively. Before elution, equilibrate Elution Buffer BE to 70 °C.

Attention:

- The list numbers in this support protocol do not correspond with the list numbers in section 5.1 and protocol-at-a-glance.
- Additional Buffer T1, Buffer B3 and Proteinase K is necessary. The **NucleoSpin® DNA Trace Bone Buffer Set** (REF 740943.25) is especially designed for completion of the NucleoSpin® DNA Trace kit. It is suited for 25 preparations of genomic DNA from human bones in conjunction with the NucleoSpin® DNA Trace kit (REF 740942.25).
- Preparation of **Lysis Buffer B3**: Transfer the total contents of **Buffer B1** to **Buffer B2** and mix well. The resulting Buffer B3 is stable for at least one year at room temperature.
- For each prep, 2 mL additional buffer is necessary (0.5 M EDTA/ 0.25 M PO_4^{3-}, pH 8, not included in the NucleoSpin® DNA Trace Bone Buffer Set).

1 Prepare sample

Mill 1 g bone to a fine powder.

2 Pre-lyse sample

Add **2 mL buffer** (0.5 M EDTA/0.25 M PO_4^{3-}, pH 8) and **7 mL Buffer T1** and **100 µL Proteinase K solution**. Vortex to mix. Be sure that the samples are completely covered with lysis solution.

If processing several samples, Proteinase K and Buffer T1 may be premixed directly before use. Do never mix Bufer T1 and Proteinase K more than 10–15 min before addition to the sample: Proteinase K tends to self-digestion in Buffer T1 without substrate.

Incubate at **56 °C overnight**.

Afterwards incubate sample for **48 h** at **4 °C** on a shaking incubator.

3 Lyse sample

Vortex the samples. Add **8 mL Buffer B3**, vortex vigorously and incubate at **70 °C** for **10 min**. Vortex briefly.

Centrifuge for **10 min** at **5,000 x *g*** and transfer the supernatant to a new microcentrifuge tube.

4 Adjust DNA binding conditions

Add **8.4 mL ethanol** (96–100 %) to the sample and vortex vigorously.

5 Bind DNA

For each sample, take one **NucleoSpin® DNA Trace F Column** placed in a Collection Tube (50 mL). Apply the sample successively to the column. Centrifuge for **3 min** at **3,000 x *g***. Discard the flow-through and place the column back into the Collection Tube.

6 Wash silica membrane

1st wash

Add **3 mL Buffer BW**. Centrifuge for **3 min** at **3,000 x *g***. Discard the flow-through and place the column back into the Collection Tube.

2nd wash

Add **3 mL Buffer B5** to the column and centrifuge for **3 min** at **3,000 x *g***. Discard the flow-through and place the column back into the Collection Tube.

3rd wash

Add **3 mL Buffer B5** to the column and centrifuge for **3 min** at **3,000 x *g***. Discard the flow-through and place the column back into the Collection Tube.

7 Dry silica membrane

Centrifuge the column for **10 min** at **3,000 x *g***.

Residual ethanol is removed during this step.

8 Elute highly pure DNA

Attach the supplied Elution Tube with adaptor to the NucleoSpin® DNA Trace F Column and insert assembly into a new 50 mL centrifuge tube (not provided). Add **60 µL Buffer BE** (preheated to 70 °C). Incubate at **room temperature** for **2 min**.

Centrifuge for **3 min** at **3,000 x *g*** to collect the nucleic acid-containing fraction.

Remove the elution tube containing the nucleic acids and keep it for further use.

6 Appendix

6.1 Troubleshooting

Problem	Possible cause and suggestions
No or poor DNA yield, poor DNA quality	*Incomplete sample lysis* • Sample was not thoroughly homogenized and mixed with Buffer FLB/ Proteinase K. The mixture has to be shaken continuously. Alternatively, prolong incubation time with Proteinase K. *Reagents not applied properly* • Prepare Buffer B5 and Proteinase K solutions according to instructions (section 3). Add ethanol to lysates before loading them on NucleoSpin® DNA Trace F Columns. *Suboptimal elution of DNA from the column* • Apply Elution Buffer BE (70 °C) directly onto the center of the silica membrane and incubate for 2 min. Elution efficiencies decrease dramatically, if elution is done with other buffers at pH ≤ 7.0.
Poor DNA qualty and/or suboptimal performance of genomic DNA in enzymatic reactions	*RNA in sample* • If RNA-free DNA is desired, add 20 µL of RNase A solution (20 mg/mL) to Lysis Buffer FLB. *Carry-over of ethanol* • Be certain to centrifuge ≥ 5 min at 3,000 x *g* in order to remove all of ethanolic Buffer B5 before eluting the DNA. If for any reason, the level of Buffer B5 has reached the column outlet after the second wash, discard flow-through. Place the NucleoSpin® DNA Trace F Column back into the Collection Tube, and centrifuge again.

6.2 Ordering information

Product	REF	Pack of
NucleoSpin® DNA Trace	740942.4/.25	4/25 preps
NucleoSpin® Funnel Column	740959	30 columns
Buffer FLB	740322.500	500 mL
Buffer BW	740922	100 mL
Buffer B5 Concentrate (for 100 mL Buffer B5)	740921	20
NucleoSpin® DNA Trace Bone Buffer Set	740943.25	1 set
Proteinase K	740506	100 mg
RNase A	740505.50 740505	50 mg 100 mg

Visit ***www.mn-net.com*** for more detailed product information.

6.3 Product use restriction/warranty

NucleoSpin® DNA Trace kit components are intended, developed, designed, and sold FOR RESEARCH PURPOSES ONLY, except, however, any other function of the product being expressly described in original MACHEREY-NAGEL product leaflets.

MACHEREY-NAGEL products are intended for GENERAL LABORATORY USE ONLY! MACHEREY-NAGEL products are suited for QUALIFIED PERSONNEL ONLY! MACHEREY-NAGEL products shall in any event only be used wearing adequate PROTECTIVE CLOTHING. For detailed information please refer to the respective Material Safety Data Sheet of the product! MACHEREY-NAGEL products shall exclusively be used in an ADEQUATE TEST ENVIRONMENT. MACHEREY-NAGEL does not assume any responsibility for damages due to improper application of our products in other fields of application. Application on the human body is STRICTLY FORBIDDEN. The respective user is liable for any and all damages resulting from such application.

DNA/RNA/PROTEIN purification products of MACHEREY-NAGEL are suitable for *IN VITRO*-USES ONLY!

ONLY MACHEREY-NAGEL products specially labeled as IVD are also suitable for *IN VITRO*-diagnostic use. Please pay attention to the package of the product. *IN VITRO*-diagnostic products are expressly marked as IVD on the packaging.

IF THERE IS NO IVD SIGN, THE PRODUCT SHALL NOT BE SUITABLE FOR *IN VITRO*-DIAGNOSTIC USE!

ALL OTHER PRODUCTS NOT LABELED AS IVD ARE NOT SUITED FOR ANY CLINICAL USE (INCLUDING, BUT NOT LIMITED TO DIAGNOSTIC, THERAPEUTIC AND/OR PROGNOSTIC USE).

No claim or representations is intended for its use to identify any specific organism or for clinical use (included, but not limited to diagnostic, prognostic, therapeutic, or blood banking). It is rather in the responsibility of the user or - in any case of resale of the products - in the responsibility of the reseller to inspect and assure the use of the DNA/RNA/protein purification products of MACHEREY-NAGEL for a well-defined and specific application.

MACHEREY-NAGEL shall only be responsible for the product specifications and the performance range of MN products according to the specifications of in-house quality control, product documentation and marketing material.

This MACHEREY-NAGEL product is shipped with documentation stating specifications and other technical information. MACHEREY-NAGEL warrants to meet the stated specifications. MACHEREY-NAGEL´s sole obligation and the customer´s sole remedy is limited to replacement of products free of charge in the event products fail to perform as warranted. Supplementary reference is made to the general business terms and conditions of MACHEREY-NAGEL, which are printed on the price list. Please contact us if you wish to get an extra copy.

There is no warranty for and MACHEREY-NAGEL is not liable for damages or defects arising in shipping and handling (transport insurance for customers excluded), or out of accident or improper or abnormal use of this product; defects in products or components not manufactured by MACHEREY-NAGEL, or damages resulting from such non-MACHEREY-NAGEL components or products.

MACHEREY-NAGEL makes no other warranty of any kind whatsoever, and SPECIFICALLY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES OF ANY KIND OR NATURE WHATSOEVER, DIRECTLY OR INDIRECTLY, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, AS TO THE SUITABILITY, REPRODUCTIVITY, DURABILITY, FITNESS FOR A PARTICULAR PURPOSE OR USE, MERCHANTABILITY, CONDITION, OR ANY OTHER MATTER WITH RESPECT TO MACHEREY-NAGEL PRODUCTS.

In no event shall MACHEREY-NAGEL be liable for claims for any other damages, whether direct, indirect, incidental, compensatory, foreseeable, consequential, or special (including but not limited to loss of use, revenue or profit), whether based upon warranty, contract, tort (including negligence) or strict liability arising in connection with the sale or the failure of MACHEREY-NAGEL products to perform in accordance with the stated specifications. This warranty is exclusive and MACHEREY-NAGEL makes no other warranty expressed or implied.

The warranty provided herein and the data, specifications and descriptions of this MACHEREY-NAGEL product appearing in MACHEREY-NAGEL published catalogues and product literature are MACHEREY-NAGEL´s sole representations concerning the product and warranty. No other statements or representations, written or oral, by MACHEREY-NAGEL´s employees, agent or representatives, except written statements signed by a duly authorized officer of MACHEREY-NAGEL are authorized; they should not be relied upon by the customer and are not a part of the contract of sale or of this warranty.

Product claims are subject to change. Therefore please contact our Technical Service Team for the most up-to-date information on MACHEREY-NAGEL products. You may also contact your local distributor for general scientific information. Applications mentioned in MACHEREY-NAGEL literature are provided for informational purposes only. MACHEREY-NAGEL does not warrant that all applications have been tested in MACHEREY-NAGEL laboratories using MACHEREY-NAGEL products. MACHEREY-NAGEL does not warrant the correctness of any of those applications.

Last updated: 07/2010, Rev. 03

Please contact:
MACHEREY-NAGEL GmbH & Co. KG
Tel.: +49 24 21 969-270
tech-bio@mn-net.com